

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today
(1) was not written for publication in a law journal and
(2) is not binding precedent of the Board.

Paper No. 18

UNITED STATES PATENT AND TRADEMARK OFFICE

**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

**Ex parte MARIA R. NARGIELLO,
GARY J. BUSH, and STURGIS G. ALLEN**

**Appeal No. 1997-0808
Application 08/235,699**

ON BRIEF

**Before KIMLIN, JOHN D. SMITH, and LIEBERMAN, Administrative Patent Judges.
LIEBERMAN, Administrative Patent Judge.**

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from the examiner's refusal to allow claims 1 through 16 which are all of the claims in the application.

THE INVENTION

The invention is directed to a method of making a low structure pyrogenic metal oxide filler selected from the group consisting of zirconium oxide, silicon dioxide, aluminum oxide, and titanium oxide, wherein the particle size is reduced and the bulk density is increased simultaneously by dry milling using an energy specific force created by a substantial number of conditions set forth in the claimed subject matter. The dry milling continues until a steady state is reached and a lowering of the structure occurs.

Structure is a property defined by the size and shape, the number of particles per aggregate and their average mass. These characteristics affect aggregate packing and the volume of voids in the bulk material.¹ Structure is measured by DBP Absorption. Dibutyl phthalate(DBP) is added until the consistency suddenly changes. See Reply Brief, page 3. As the structure of a pyrogenic metal oxide is lowered, the oil absorption is reduced.

THE CLAIMS

Claim 1 is illustrative of appellants' invention and is reproduced below.

1. A method of producing a low structure pyrogenic metal oxide filler comprising simultaneously reducing particle size/aggregate size and increasing bulk density by subjecting pyrogenically produced metal oxide agglomerates and aggregates selected from the group consisting of zirconium oxide, silicon dioxide, aluminum oxide, and titanium oxide to a dry milling process whereby the pyrogenically produced metal oxide is contacted in a agitating zone with an energy specific force created by the following

¹ Encyclopedia of Chemical Technology, 3rd ed., Kirk-Othmer, Vol. 4, p. 638, John Wiley & Sons, New York (1979).

conditions:

agitating media bed consisting of a member selected from the group consisting of stainless steel, chrome steel, carbon steel, ceramic, aluminum oxide, tungsten carbide, zirconium carbide, zirconium oxide, and zirconium silicate whereby the metallic oxide agglomerates and aggregates are free to move, collide and impinge on each other, wherein the media is kept in constant agitation by a rotating shaft with protruding extensions of a length or by a rolling drum, the media diameter being 0.04 to one inch in diameter and being of circular, spherical or cylindrical shape, the shaft speed being between 100 and 1500 rpm or the roller drum speed being between 30 to 120 rpm, wherein the media fills the volume of the agitating zone to the extent of 1/4 to 3/4 of its total volume and wherein the dwell time in the zone is controlled by the amount of time the metallic oxide remains in the media bed or by the number of passes through the media bed, evaluating the resulting product until a steady state condition is reached and wherein the lowering of the structure of the pyrogenic metallic oxide is a function of the time of compression, the amount of compressive force exerted on the aggregate/agglomerate particles and the conditions of compression.

THE REFERENCES OF RECORD

As evidence of obviousness, the examiner relies upon the following references.

Abolins et al. (Abolins)	4,233,199	Nov. 11, 1980
Ettlinger et al. (Ettlinger)	4,307,023	Dec. 22, 1981
Kostansek	4,427,450	Jan. 24, 1984
Bilimoria et al. (Bilimoria)	4,693,427	Sep. 15, 1987

Perry's Chemical Engineers' Handbook (Perry's), 6th ed. McGraw-Hill, Inc., pp. 8-32, 8-33 & 8-34 (1984).

THE REJECTION

Claims 1 through 16 stand rejected under 35 U.S.C. § 103 as being unpatentable over Ettlinger in view of Kostansek, Bilimoria, Abolins and Perry's.

OPINION

We have carefully considered all of the arguments advanced by appellants and the examiner and agree with appellants that the aforementioned rejection under 35 U.S.C.

§ 103 is not well founded. Accordingly, we do not sustain the examiner's rejection.

The Rejection under § 103

"[T]he examiner bears the initial burden, on review of the prior art or on any other ground, of presenting a *prima facie* case of unpatentability." See In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). The examiner relies upon a combination of five references to reject the claimed subject matter and establish a *prima facie* case of obviousness. The basic premise of the rejection is that the primary reference to Ettlinger discloses a method for ball milling a composition containing pyrogenic silicon dioxide. According to the examiner, the balance of the references taken together discloses that the ball milling process of Ettlinger necessarily results in producing a pyrogenic metal oxide having a low structure, reduced particle size/aggregate size and increased bulk density. We disagree.

Ettlinger discloses ball milling a composition containing pyrogenically produced silica. Other requisite ingredients include precipitated silica, a hydrophobization agent such as

silicone oil and aluminum oxide. See Example. The product which had an initial bulk density of 60 g/l was compacted to a bulk density of 80-150 g/l. However, neither particle size nor structure is discussed by Ettlinger.

The examiner thereafter relies upon references to Kostansek and Bilimoria, directed to calcined kaolin clay, to show that improvements in reduction of oil absorption and increase in bulk density are obtained by dry milling the clay. Although the examiner argues that clays are aluminosilicates, which are oxides of the metals aluminum and silicon, and would have reasonably been expected to behave like aluminum oxide and silicon oxide, evidence of record presented as a Declaration under 37 CFR § 1.132 by Nargiello teaches otherwise. The properties of surface area, particle size and DBP absorption in grams/100g for fully calcined kaolin is substantially different from values obtained for any of pyrogenic silicon dioxide, aluminum oxide, titanium oxide or zirconium oxide. See Exhibit C, page 5. Accordingly, we conclude that the person having ordinary skill in the art would not have a reasonable expectation that pyrogenic metal oxide would perform in the same manner as calcined kaolin clay based on the teachings of Kostansek and Bilimoria.

We are accordingly left with the teachings of Perry's which disclose many of the specific process conditions required by the claimed subject matter for ball milling. However, the issue before us is not whether the numerous conditions for ball milling are known. Rather, it is whether there is recognition, based on the record before us, that destructuring necessarily occurs upon ball milling the composition of Ettlinger.

We answer that question in the negative. We determine that there is no recognition in

Ettlenger of making a low structure pyrogenic metal oxide. Nor is there, on the record before us, any evidence that the structure of a pyrogenic oxide is necessarily lowered by dry milling. Indeed, the only evidence of record would appear to suggest that dry milling does not necessarily result in lowering of structure. See specification, pages 18 and 19.

Stated otherwise, the examiner suggests that based upon the prior art one would have been motivated to optimize the instant parameters of the milling process in accordance with the teachings of Perry's. See Answer, page 6. However, we determine that there is no suggestion or motivation to optimize the ball milling process of Ettlenger. Nor, on the record before us, is there any reasonable expectation that even if the ball milling process was optimized that one would necessarily obtain a destructuring of the pyrogenic oxide.

We further conclude that the prior art would not have suggested to those of ordinary skill in the art that they should make the claimed subject matter and would not have revealed that in so making or carrying out, those of ordinary skill in the art would have had a reasonable expectation of success. See In re Vaeck, 947 F.2d 488, 493, 20 USPQ2d 1438, 1442 (Fed. Cir. 1991).

DECISION

The rejection of claims 1 through 16 under 35 U.S.C. § 103 as being unpatentable over Ettlinger in view of Kostansek, Bilimoria, Abolins and Perry's is reversed.

The decision of the examiner is reversed.

REVERSED

Edward C. Kimlin)	
Administrative Patent Judge)	
)	
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John D. Smith)) BOARD OF PATENT
Administrative Patent Judge)	APPEALS AND
)	INTERFERENCES
)	
Paul Lieberman)	
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